

— Manifestation of M2 tide in the spectra of baroclinic inertia-gravity waves

Roman E. Glazman

Jet Propulsion Laboratory, Caltech, Pasadena, CA, 91109. U.S.A.

reg@pacific.jpl.nasa.gov

and

Randy Watts, GSO/URI, Narragansett, RI 02882-1197

ABSTRACT

Case studies of sea surface height (SSH), ocean currents and thermocline depth (Z12) spatial and temporal oscillations are reported, with an emphasis on interactions between M2 tide and an ambient field of long internal gravity waves. Using Topex/Poseidon data, as well as Z12 and ocean currents measurements from the SYNOP experiment, we analyze kinetic and potential energy spectra of baroclinic inertia-gravity (BIG) waves, both in the wavenumber and frequency domains. These spectra show a remarkably good general agreement with recent predictions [J. Phys. Oceanogr. , 26(7) , 1256-1265, 1996] of wave turbulence theory for scale-dependent systems. The presence and relative height of the M2 tidal. peak depends on several external factors. At mid-latitudes this peak may appear as the dominant feature in the Z12 spectra, yet being barely visible in the ocean current spectra. The latter are always dominated by the inertial peak. Theory provides a simple explanation of this apparent inconsistency. Main theoretical points are briefly reviewed to interpret the data.